

The Cultural, Pharmacological, and Spiritual Significance of *Tri Ketuka* in Balinese Healing and Yoga

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Abstract: This study delves into the cultural, pharmacological, and spiritual significance of *Tri Ketuka*, a traditional Balinese polyherbal formulation composed of *Acorus calamus*, *Cryptocarya massoy*, and *Allium sativum*, as documented in classical *Usadha* manuscripts. These three plants are not only known for their therapeutic properties but also for their symbolic role in promoting balance and holistic well-being within Balinese healing and yoga traditions. This qualitative study employed document analysis to investigate the use of *Tri Ketuka* in both healing rituals and yoga-based practices, particularly the *Jala Neti* nasal cleansing technique. The analysis is supported by illustrative testimonial evidence from users. The findings underscore the medicinal, spiritual, and cultural value of *Tri Ketuka*, affirming its relevance in both traditional and modern wellness contexts. The study also highlights the potential for integrating Balinese traditional medicine into contemporary healthcare as part of alternative and complementary therapies.

Keywords: *acorus calamus*; *allium sativum*; *cryptocarya massoy*; *jala neti*; polyherbal; *usadha* Bali; *tri ketuka*

1. Introduction

Traditional Balinese medicine is deeply intertwined with physical healing, cultural identity, and spiritual practice. One of the most notable traditional healing systems is *Usadha Bali*, a medical manuscript tradition written on palm leaves in Balinese script. Thought to have originated in the 16th century under the influence of Dang Hyang Dwijendra, these texts document indigenous knowledge passed down through generations (Muderawan et al., 2024).

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The word *usadha* is derived from the Sanskrit word *ausadhi*, which refers to plants with medicinal properties. The word *usadha* for Balinese people has often been used in everyday conversations regarding the treatment of sick people. Traditional Balinese medicine (*usadha*), introduced by ancestors, is a healing science inspired by Hindu religious values (Suardiana, 2018; Sujarwo et al., 2016). *Tri Ketuka*, an important herb in this treatment, consists of three main ingredients: dringol/jangu (*Acorus calamus* L.), masoyi (*Cryptocarya massoy* (Oken) Kosterm.), and garlic (*Allium sativum* L). This herb is known for its pharmacological benefits and is imbued with deep spiritual significance to maintain a balance between the physical, mind, and soul.

Jala Neti is a yoga practice related to achieving physical balance (Figure 1). *Jala Neti* is a nasal cleansing technique used in *Hatha Yoga* to maintain the cleanliness of the respiratory tract and sinuses. This method involves rinsing nostrils with warm saltwater to remove dirt, mucus, and microorganisms that can interfere with breathing. It helps increase concentration and peace of mind, which are very much needed in various aspects of yoga, including meditation and *pranayama* (control of the breathing process). Maintaining respiratory health through *Jala Neti* supports *Karma Yoga* practitioners in remaining focused and calm in every action, without being disturbed by health problems that can hinder daily activities (Saraswati, 2008).



Figure 1. *Jala Neti* demonstrated by I Made Sugata (Photograph by Luh Putu Yulyani)

In this context, the herb *Tri Ketuka* plays an important role in supporting the practice of *Jala Neti* and *Karma Yoga*. *C. massoy* has antimicrobial properties (Iyengar, 1996) that help protect the respiratory tract from infection, whereas *A. sativum* is known for its anti-inflammatory and immune-boosting properties (Saraswati, 2008; Sivananda, 2001). *A. calamus* has a calming effect and supports mental balance, which is essential for practicing *Karma Yoga* (Zhao et al., 2023). According to Kalra et al. (2022), there is a significant relationship between additional therapeutic interventions, such as yoga, and patients' cardiovascular health. However, the application of complementary therapy combining Usadha with Yoga has never been discussed in depth regarding the relationship between the two.

This study aims to explore how *Tri Ketuka* functions not only as an herbal medicine from a pharmacological perspective but also as part of the cultural and spiritual heritage of the Balinese people from a symbolic and cultural perspective. By understanding the symbolic and cultural aspects of *Tri Ketuka*, we can better appreciate the role of traditional medicine in shaping the Balinese cultural identity and its continued relevance.

2. Literature Review

The roots of traditional medicine in Indonesia can be traced back to ancient civilizations that have utilized local natural resources for healing purposes (Suyami et al., 2025). Over time, the culture related to documentation (either in the form of notes or pictures) associated with the daily habits of society became known. The legacy of the Majapahit Kingdom is reflected in the Tenggerese community through preserved healing knowledge and written records of traditional medicine (Nugraha et al., 2024). The Majapahit Kingdom (1293-1527 AD) was the largest kingdom that at that time had as much power as Southeast Asia today. The reign of Hayam Wuruk (1350-1389 AD) was the peak of Majapahit's glory before the entry of Islamic influence into the archipelago (Munandar, 2020). Subsequently, many authors emerged scattered throughout Bali. The writings concerned the fields of religion or divinity, *sesana* (morality or ethics as a guide to life), *wariga* (traditional calculation science to determine auspicious days), *usadha* (medicine), *babad* (history of a region or kingdom), and *itihasa* (Hindu literature that conveys heroic stories of Hindu kings and knights in the past). Balinese *usadha* is a manuscript that has received considerable attention in traditional medicine that has been applied.

The Balinese *usadha* outlines the diagnosis of diseases (*tatenger*), herbal ingredients, methods of application, and healing mantras. *Usadha* is written on palm leaves using the Balinese script known as *Lontar Usadha*. Various types of *lontar usadhas* were distributed based on their purpose.

Various texts, including *Usadha Sari*, outline the procedures for becoming a traditional healer (*balian usadha*) and provide treatments for infants and rheumatic conditions (Mujizah, 2016). Rheumatism is the subject of *Usadha Tuju* and *Usadha Cukildaki* (Ardiyasa, 2021; Mujizah, 2016). Additional texts, including *Usadha Sawah*, address agricultural applications, specifically the management of pests in paddy fields (Mujizah, 2016). In contrast, *Usadha Bang* offers recommendations for general adult treatment (Adiputra & Trapika, 2018).

Plant-based therapies play a crucial role in *Usadha Taru Pramana* (Adnyana, 2019), while *Usadha Sato* encompasses preparations that incorporate animal-derived ingredients (Suatama, 2021). Certain treatises, such as *Usadha Punggung Tiwas* and *Usadha Penglukatan Gering*, emphasize ceremonial and spiritual healing and integrate cleansing rituals and lifestyle recommendations (Mujizah, 2016). The *usadha* texts address specific ailments such as mental illness (*Usadha Buduh*), leprosy (*Usadha Ila*), smallpox (*Usadha Kacacar*), and internal diseases (*Usadha Dalem*). Additionally, *Usadha Kuda* is specifically designated for the treatment of horses (Mujizah, 2016; Suatama, 2021). Pediatric and maternal care are comprehensively addressed in *Usadha Kuranta Bolong*, *Usadha Rare*, and *Usadha Manak* (Ngurah, 2020; Mujizah, 2016).

Additional texts, including *Usadha Pamugpug* and *Pamugpugan*, address general herbal knowledge and illnesses associated with supernatural causes (Mujizah, 2016). *Usadha Mala* pertains to mumps and oil preparation, whereas *Usadha Netra* concerns eye health (Adiputra & Trapika, 2018; Tirta & Putra, 2020). *Usadha Tenung Tanya Lara* examines diagnostic methods and the timing of treatments (Sudiasta & Suwidja, 1991).

The ritual and spiritual dimensions in *Usadha Sasah Bebai* and *Tumbal* are apparent, addressing methods for neutralizing negative spiritual influences and the significance of ritual symbols, respectively (Surka, 2020; Ardiyasa, 2021). *Usadha Tiwang* and *Upas* concentrate on particular disease syndromes marked by pain and symptoms associated with venom (Arsana et al., 2020; Dewi, Dewi et al. 2013). *Usadha Rukmini Tatwa* advocates women's health and household harmony (Desi, 2021), whereas *Usadha Budhakecapi* delineates fundamental therapeutic principles in Balinese healing (Kade et al., 2021).

Usadha medicines are prepared as oral formulations (e.g., *loloh*) or topical applications (e.g., *parem and boreh*) based on traditional practices (Muderawan et al., 2024). Concoctions exist in the form of fresh products that are pureed or cooked products, such as decoctions (Putra, 2020). Inconsistencies in the dosage of ingredients in *Usadha* can affect the final results of consumption in terms of appearance, taste, benefits, and possible adverse side effects (Nita et al., 2023). Furthermore, comprehensive details regarding dosage and duration of use are typically absent in *usadha* manuscripts (Adiputra & Trapika, 2018). Traditional

formulations typically outline the ingredients and methods of administration; however, they often lack specific details regarding the quantity, frequency, and duration of the treatment. The absence of precision presents challenges for standardization and clinical validation.

Tri Ketuka constitutes a fundamental element present in most *usadha* medicinal preparations. As the understanding of traditional Balinese medicine grows, *Tri Ketuka* has gained attention as a herb with significant pharmacological potential. Recent studies have predominantly investigated single herbs in *Tri Ketuka*, with limited attention given to the synergistic effects inherent in *Tri Ketuka* herbs (Hamzah et al., 2020; Magryś et al., 2021b; Sharma et al., 2020).

Mental and emotional health are essential for *the usadha*. Through meditation and breathing techniques, yoga helps calm the mind, reduces anxiety, improves emotional well-being, and supports holistic healing processes (Bhogal, 2021). Yoga posture improves flexibility, strength, and posture. This supports healing from injuries or musculoskeletal problems and helps the body to recover and function better (Sharma et al., 2019). Yoga also plays an important role in maximizing the medicinal properties of *usadha*. Yoga enhances *usadha* healing through physical, mental, and spiritual mechanisms (Kishan, 2020; Woodyard, 2011). In the *usadha*, health results from the balance of energy (prana) in the body. Yoga helps reduce stress through relaxation and breathing techniques, which can support the healing process by reducing the negative impact of stress on the body (Zok et al., 2024).

The incorporation of yoga into conventional medical systems, such as Ayurveda, Siddha, and Unani, is significant, collectively highlighting a comprehensive approach to physical, mental, and spiritual well-being. Yoga has received international acknowledgment, including from the World Health Organization, as an effective therapeutic approach for stress reduction, emotional regulation, and chronic disease management (Narayanan, 2025).

Hatha yoga is a part of yoga that emphasizes the physical, mental, and spiritual aspects of exercise. *Hatha yoga* comes from the words *ha*, which means sun, and *tha*, which means moon. According to Saraswati in Juniarta and Anjani (2023), *hatha yoga* is a combination of two *bija* mantras in Sanskrit, *ha* and *tha*. *Ha* symbolizes the flow of the sun in the pinggala, which is masculine, and *tha* symbolizes the flow of the moon from the IDA, which is feminine.

Jala neti is one of the *sat karma* or six types of cleansing exercises in *hatha yoga*. *Sat karma* consists of several types of exercises, including: 1) *neti*, which cleanses the nasal passages; 2) *dhauti*, which cleans the digestive tract from the mouth to the intestines; 3) *nauli*, which massages and strengthens the abdominal organs; 4) *basti*, which cleans and balances the large intestine; 5) *kapalabhati*,

which cleans the brain; and 6) *tratak*, which looks at an object with a focus on developing concentration and awakening latent psychological abilities.

The *Jala Neti* exercise is intended to clean nostrils using warm water mixed with salt. This exercise was performed by flowing water with the help of a pot or small vessel inserted from the left nostril and removed from the right nostril and vice versa. The head was tilted, the water was inserted through the nostrils, and the mouth was opened to facilitate breathing. This exercise was performed for 20 s on each nostril, alternating between the left and right sides (Satyananda, 2002). In principle, the *Jala Neti* exercise aims to maintain the cleanliness of both the nostrils. According to Sivananda (1994), nostrils should always be clean. Unclean nostrils can result in irregular breathing. Irregular breathing can also cause pain.

Some *yoga asanas* are designed to stimulate and improve the digestive system function. This can help heal digestive conditions and support overall health, which aligns with the principles of *usadha*, emphasizing the importance of a healthy digestive system (Shree et al., 2021). Yoga increases blood flow and helps the lymphatic system function properly, supporting detoxification and removing toxins from the body (Aggithaya et al., 2015; Panjeta, 2019; Woodyard, 2011). This is especially important in *usadha* medicine, which often includes detoxification approaches for improving health.

Within the field of holistic health, limited research has explored the integration of *Tri Ketuka* into yoga-based therapeutic practices. Additionally, most studies have focused on individual herbs (Afzal et al., 2022; Fujisawa et al., 2008; Permanasari et al., 2017) rather than their synergistic effects in traditional formulations. This study fills this gap by examining the cultural, pharmacological, and overall health effects of *Tri Ketuka* in yoga therapy.

3. Method and Theory

This study utilises a qualitative approach through document analysis to investigate the symbolic, cultural, and therapeutic meanings inherent in *usadha* Bali texts, with a specific focus on the application of *Tri Ketuka*. This analysis employs symbolic anthropology to interpret traditional healing practices as culturally constructed systems of meaning, wherein herbal remedies signify medicinal substances as well as cosmological values, such as purification and balance.

This study incorporates perspectives from ethnopharmacology, allowing for an interpretation of *Tri Ketuka* as a polyherbal preparation with therapeutic potential and as a cultural artifact influenced by rituals and beliefs. The incorporation of *Jala Neti* and *karma yoga* practices illustrates the principles of the holistic health model, highlighting the interrelation between physical, mental, and spiritual well-being.

This study enhances the analysis by including illustrative testimonials from *Tri Ketuka* users and data derived from pertinent scientific research articles. The sources offer empirical and experiential insights that enhance the understanding of *Tri Ketuka* as both a functional herbal remedy and a significant component of traditional healing practices.

The data for this research were gathered from primary sources, including thirteen *lontar* manuscripts that document Balinese traditional medicine practices such as *Usadha Buduh*, *Usadha Cukildaki*, *Usadha Dalem*, *Usadha Ila*, *Usadha Kacacar*, *Usadha Kuda*, *Usadha Kurantabolong*, *Usadha Manak*, *Usadha Pamugpug*, *Usadha Pamugpugan*, *Usadha Rare*, *Usadha Tiwang*, and *Usadha Budhakecapi*. These manuscripts were selected based on their relevance to the study's focus on *Tri Ketuka* and its role in traditional healing and yoga practices.

Document analysis involved several steps. First, we identified and selected *Usadha* texts that contained references to *Tri Ketuka*, ensuring that the texts reflected both medicinal and cultural perspectives. Then, each selected text was then analyzed to extract key themes and patterns related to the use of *Tri Ketuka* in traditional healing. In particular, we focused on how the ingredients of *Tri Ketuka*, *A. calamus*, *C. massoy*, and *A. sativum* were described, prepared, and used within the cultural and spiritual context of Balinese healing practices. Finally, the data were analyzed thematically, focusing on key elements, such as the medicinal properties of *Tri Ketuka*, its role in healing ritual practices, and its integration into yoga health traditions. The findings were then compared and contrasted with existing literature on Balinese traditional medicine and its relevance to contemporary wellness practices.

4. Results and Discussion

The species identified in the *Usadha* palm-leaf manuscripts were primarily those that occur in Bali. In the context of medicinal applications, various methods have been employed, including *apunin* (oiled), *borehin* (a traditional Balinese body scrub composed of spices, such as ginger and turmeric, utilized for warming the body and enhancing blood circulation), *loloh* (oral or herbal medicine), *oles* (smear), *pepeh* or *tutuh* (nasal drops), *ses* (treatment by pressing the affected area with heated materials), *simbuh* (spray), *urap* (topical medicine), and *usug* (applied repeatedly).

Various medicinal herbs have been used throughout the manuscript, and each *usadha* has a medicinal purpose. Each *usadha* contains a composition of ingredients, mantras, efficacy, and how to use them, which are explained in detail based on the customs and beliefs that have been carried out for generations. *Tri Ketuka* is one component of almost every *usadha*. This herb is known for its pharmacological benefits and has deep spiritual meaning in maintaining a

balance between the physical, mental, and soul. Balinese medicine represents a holistic method that integrates medicinal plants, spiritual energy, and Balinese Hindu traditions to support healing (Adiputra, 2023; Pranatha, 2023).

Tri Ketuka concoction is a mixture of three ingredients, namely *kesuna* or garlic (*A. sativum* L.), *jangu* or dringo (*A. calamus* L.), and *mesui* or *masoyi* (*C. massoy* (Oken) Kosterm.) (Arsana et al., 2020; Sugata et al., 2023). Pictures of the medicinal plants contained in *Tri Ketuka* are shown in Figure 2.



Allium sativum L.



Acorus calamus L.



Cryptocarya massoy (Oken)
Kosterm.

Figure 2. Composition of *Tri Ketuka*

4.1 Health Benefits of *Tri Ketuka* Based on Empirical Data

The empirical applications of *Tri Ketuka* are documented across various *usadha* manuscripts such as *Usadha Buduh*, *Usadha Dalem*, *Usadha Ila*, *Usadha Kuranto Bolong*, *Usadha Manak*, and *Usadha Rare*, and reflect its wide therapeutic range. As shown in Appendix Tables 1–4, *Tri Ketuka* is employed to treat diverse conditions, including mental disorders, *tiwang* syndromes (psychosomatic or energy-related conditions), infections, and other systemic or somatic complaints.

In the context of mental illness (Appendix Table 1), it is used in formulations addressing symptoms such as wandering behavior, constant singing, laughing, or reckless behavior. For many *tiwang* syndromes (Appendix Table 2), *Tri Ketuka* is commonly applied as part of topical preparations, sprays, scrubs, or liniments. *Tiwang* is characterised by symptoms including a sensation of bodily emptiness, pain and aches, restlessness, bulging eyes, muscle stiffness, and potential fainting. *Tiwang* types are classified based on their specific presenting symptoms (Arsana et al., 2020). The data further show its use in infectious diseases, such as leprosy, boils, and otitis (Appendix Table 3), as well as in various other conditions, such as fatigue, convulsions, migraine, stiff neck, muscle injury, and digestive disorders (Appendix Table 4).

Beyond its pharmacological utility, *Tri Ketuka* has also been integrated into therapies that involve ritual and spiritual dimensions, as detailed in Appendix Table 5. In these cases, the preparation and application of the herbal remedies are accompanied by the recitation of mantras intended to expel spiritual disturbances and activate healing energies. This dual role—therapeutic and symbolic—highlights the position of *Tri Ketuka* not only as a healing substance but also as a ritual medium central to Balinese cosmological and medical systems.

In *Usadha* texts, *Tri Ketuka* is frequently utilized alongside other herbal components, a practice known as a polyherbal formulation. This approach posits that a combination of multiple herbs may yield synergistic effects, thereby improving the overall therapeutic outcome (Karole et al., 2019). The ingredients are clearly specified; however, the quantities are frequently conveyed using traditional measurements, such as “slices” (slide). Although precise standardization is absent, traditional units can be interpreted and converted into contemporary measurements. A “slice” generally denotes a segment measuring approximately 5–7 millimeters, aligning with standardized units in modern herbal pharmacology.

4.2 Phytochemical Compound Content in *Tri Ketuka* Herbal Plants

Classical Balinese medicinal texts, including *usadha*, indicate that the *Tri Ketuka* formulation has been traditionally used for the treatment of various ailments (refer to the Appendix). Recent pharmacological research has reinforced the therapeutic potential of these plants, demonstrating antibacterial effects, gastrointestinal relief, mental health support, and improved physical endurance. The phytochemical constituents associated with these activities are presented in Table 1.

Table 1. Phytochemical Compound Content in *Tri Ketuka* Herbal Medicine

Plant	Phytochemical Compounds	Sources
<i>Acorus calamus</i> L.	α -asarone, β -asarone, γ -asarone, acorone, acoramone, calamene, calameone, dan calamenenol	(Afzal et al., 2022)
<i>Cryptocarya massoy</i> Becc.	C ₁₀ massoia lactone, C ₁₂ massoia lactone, benzyl benzoate, C ₈ massoia lactone, δ -decalactone, dan benzyl salicylate	(Rolli et al., 2016)
<i>Allium sativum</i> L.	allicin, diallyl disulfide, vinylidithiins, ajoenes, diallyl trisulfide	(El-Saber Batiha et al., 2020)

The dringo rhizome consists of α -asarone, β -asarone, γ -asarone, acorone, acoramone, calamene, calameone, and calamenenol (Afzal et al., 2022). Administration of 500 mg dringo rhizome powder for one month in hyperlipidemia patients resulted in a decrease in skinfold depth, fatigue, and excessive hunger (Sharma et al., 2020). Other researchers have tested the effects of hydroethanol extract capsules from dringo rhizomes in a group with anxiety disorders. The results of this study indicate that the ingestion of this extract can alleviate anxiety- and stress-related problems (Bhattacharyya et al. 2011).

The bark of *masoyi* has been widely investigated for its phytochemical content and potential bioactivity. Analysis of the essential oil of *masoyi* bark using Gas Chromatography with Flame Ionization Detector (GC-FID) and Gas Chromatography/Mass Spectrometry (GC/MS) showed that 98.61% of it contained massoia lactone. The main components are C10 massoia lactone, C12 massoia lactone, benzyl benzoate, C8 massoia lactone, δ -decalactone, and benzyl salicylate (Rolli et al., 2016). Testing the potential bioactivity of C10 Massoia lactone as an immunomodulatory agent showed activation of macrophage phagocytosis at a concentration of 2.5 - 30 ppm (Permanasari et al., 2017). This compound can also inhibit the formation of *Candida albicans* biofilms with an IC_{50} value of 0.026 ppm (Hertiani et al., 2016) and eradicate the formation of *Staphylococcus aureus* biofilms at a concentration of 1% v/v by 86.8% (Hamzah et al., 2020).

Garlic bulbs are reported to contain many sulfur-containing compounds, such as allicin, diallyl disulfide, vinylidithiins, ajoenes, and diallyl trisulfide, which account for approximately 80% of the sulfur content in garlic (El-Saber Batiha et al., 2020). The content of these compounds also contributes to the pharmacological potential of garlic bulbs, such as antioxidant, antimicrobial, anticancer, anti-inflammatory, hepatoprotective, and cardioprotective effects (Tudu et al., 2022). A meta-analysis showed that garlic bulb supplementation has the potential to overcome metabolic syndrome by significantly reducing serum triglyceride levels, total cholesterol, low-density lipoprotein (LDL), diastolic blood pressure, body mass index, and waist circumference compared with placebo (Fu et al., 2023). Garlic bulbs have also been reported to increase testosterone levels and improve the testicular structure (Musavi et al., 2018). In another study, the administration of allicin-containing capsules for 3 months resulted in a lower incidence of common cold than the placebo group (Lissiman et al., 2014). Our in vitro study showed that garlic extract exhibited low antibacterial activity against *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli*, and *Pseudomonas aeruginosa*, with a minimum inhibitory concentration (MIC) greater than 8192 ppm for most tested bacteria. This limited effect may be due

to the absence of key volatile compounds such as allicin in the tested extract. The limited effect may result from the lack of essential volatile compounds, such as allicin, in the examined extract (Sugata et al., 2023).

4.3 Health Benefits of Tri Ketuka Based on Scientific Data

Pharmacological studies have confirmed that the components of *Tri Ketuka* possess a range of biological activities, particularly antimicrobial and neuroprotective effects. In vitro studies have shown that *A. sativum* exhibits broad-spectrum antibacterial and antifungal activities, including efficacy against multidrug-resistant strains (Magryś et al., 2021b). Synergistic effects have been noted when *A. sativum* is combined with *A. calamus*, *Mucuna pruriens*, and *Sesamum indicum* L, particularly against *S. aureus* (Arasu et al., 2019). *A. sativum* and *A. calamus* exhibit a combined inhibitory effect on fungal pathogens including *Fusarium solani* and *Aspergillus flavus* (Sagar, Sharma, & Srivastava, 2011). *C. massoy*, particularly through its massoia lactone content, has demonstrated antibiofilm activity against *C. albicans* (Hertiani et al., 2016).

However, a study by Sugata et al. (2023) found that the three *Tri Ketuka* components have relatively low antibacterial activity—minimum inhibitory concentrations (MIC > 4096 ppm)—against common rhinosinusitis pathogens such as *S. aureus*, *S. epidermidis*, *E. coli*, and *P. aeruginosa*. Despite this, *A. sativum* has shown in vivo antiparasitic effects, as evidenced by its efficacy in inhibiting *Giardia* growth after 72 h of treatment (Sahidur et al., 2023), suggesting a broader antimicrobial potential beyond bacterial targets.

In the context of mental health, *A. sativum* has been shown to reduce anxiety- and depression-like behaviors in diabetic rats, potentially through its antioxidative effects on the brain (Rahmani et al., 2020). Likewise, *A. calamus* exhibited antidepressant and antioxidant properties in rodent models subjected to social isolation stress (Rai et al., 2023), supporting its traditional use for neuropsychological disturbances.

4.4 Benefits of Yoga in the Perspective of Balinese People

Yoga has the potential to improve muscular strength, body flexibility, respiratory and cardiovascular function, addiction recovery, stress reduction, sleep patterns, and overall well-being (Woodyard, 2011). Yoga in Bali is also unique because it is often combined with local cultural rituals such as meditation and self-purification (*melukat*) (Figure 3).



Figure 3. Illustration of the execution of *melukat* at Pura Taman Suranadi, West Lombok, Indonesia, conducted by I Made Sugata (Photograph by Ni Made Putri).

Yoga is mentioned as a self-transforming practice in *Śivāgama* text by Ida Pêdanda Madé Sidêmên (1858–1984). This text shows that yoga is not only a physical exercise, but also a spiritual means to achieve personal transformation. *Śivāgama* text includes various forms of yoga and *samādhi* that aim to purify the body and mind. This text presents each type of yoga, along with a description of its associated deity, guidance on how to perform it, and the resulting benefits. Yoga not only focuses on physical health but also provides spiritual enlightenment and mental balance (Novitasari, 2022).

4.5 Benefits of *Jala Neti* combined with *Tri Ketuka*

In traditional Balinese healing practices, *Tri Ketuka* herbs are understood in pharmacological terms and cultural and spiritual contexts. In addition to its proven pharmacological benefits, the use of *Tri Ketuka* in yoga, particularly in *Jala Neti*, demonstrates its importance in maintaining holistic health. *Jala neti* also has a calming and cooling effect on the brain and nervous disorders, epilepsy, anger, migraines, and depression. It provides a light and fresh feeling to the head and eliminates drowsiness (Satyananda, 2002).

Daily *Jala Neti* practice has the following extraordinary benefits: 1) maintaining the cleanliness of the nostrils by removing bacteria from the mucus in the nose; 2) overcoming respiratory disorders, such as asthma, sinusitis, allergies, sore throats, and coughs; 3) reducing middle ear infections; 4) reducing migraines; 5) helping the eyes become clearer; 6) reducing snoring and making sleep sounder; 7) clearing the mind and reducing stress; 8) overcoming headaches, anger, and mental tension; 9) improving the quality of meditation; and 10) helping reduce cigarette addiction (“*Jala Neti*,” n.d.)

The health benefits of *Jala Neti* may be enhanced when combined with *Tri Ketuka* ointment, which possesses antibacterial properties. The combination of *Jala Neti* exercises with *Tri Ketuka* ointment can further optimize yoga *Jala Neti* practices. *Tri Ketuka* was used in combination with *Jala Neti* exercises by applying the herbal formula to the nostrils. The herbs were applied after completing all stages of the *Jala Neti* exercise.

Similar to the mechanism observed in Traditional Chinese Medicine (Chen & Liu, 2024), in which herbal formulations enhance mucosal immunity and sinus drainage, *Tri Ketuka* also exhibits synergistic effects in nasal cleansing. *A. calamus* acts as an antibacterial (Rita et al., 2017), antianxiety agent (Rai et al., 2023), and airway relaxant (Shah & Gilani, 2010), *C. massoy* provides antimicrobial (Rollando, 2019), anti-inflammatory (Sa’roni & Adjirni, 1999), and *A. sativum* acts as an antibacterial agent, enhances the immune system, promotes relaxation due to its anxiolytic properties, and modulates inflammation (Donma & Donma, 2020; El-Saber Batiha et al., 2020; Magryś et al., 2021b; Rahmani et al., 2020; Tudu et al., 2022), making this formulation highly relevant to *Jala Neti* practices.

An illustrative testimonial was obtained from a patient previously diagnosed with sinusitis, who adopted a self-treatment approach by combining warm saline nasal irrigation (*Jala Neti*) twice daily with the topical application of *Tri Ketuka* ointment inside the nostrils. The patient reported a noticeable response after the first application, with continued improvement after ten days of consistent use. Upon follow-up examination by an Ear, Nose, and Throat (ENT) specialist, the sinus cavities were found to be dry and free of infection. While anecdotal, this account suggests the potential role of *Tri Ketuka* in complementing traditional yogic cleansing techniques for upper respiratory relief. This aligns with the empirical records of *Tri Ketuka* in infection-related therapies as well as scientific findings supporting its antibacterial and anti-inflammatory properties. In addition to this case, two further anecdotal testimonies were collected, reflecting other practical outcomes experienced by *Tri Ketuka* users in conjunction with *Jala Neti*.

Another user who had long experienced an unpleasant sinus odor reported a significant improvement after applying *Tri Ketuka* ointment post-*Jala Neti* practice. Within a few days, the smell associated with sinus discharge markedly diminished, contributing to greater comfort and confidence in daily interactions. This experience reinforces the traditional claim that *Tri Ketuka* supports mucosal cleansing and inhibits microbial activity. A patient previously troubled by persistent ear ringing and mild hearing loss noted that the symptoms subsided after incorporating *Tri Ketuka* ointment alongside regular *Jala Neti* exercises. The individual reported that the ringing stopped entirely and hearing gradually returned to normal. This anecdotal evidence aligns with the traditional use of *Tri Ketuka* to address head-related disturbances, supporting its role in balancing sensory function. While individual responses may vary, these cases offer preliminary insights into the experiential dimension of *Tri Ketuka*'s therapeutic role and support the relevance of further systematic investigations.

5. Conclusion

This study demonstrated that *Tri Ketuka*, a traditional Balinese polyherbal formulation consisting of *Acorus calamus*, *Cryptocarya massoy*, and *Allium sativum*, possesses considerable pharmacological, spiritual, and cultural significance. The primary finding highlights its dual role: it serves as a therapeutic agent, substantiated by ethnomedical and scientific evidence, while also functioning as a symbolic medium within Balinese healing rituals and yoga practices, such as *Jala Neti*. The incorporation of *Tri Ketuka* into yoga improves its comprehensive advantages by targeting physical, mental, and spiritual health.

These findings underscore the capacity of *Tri Ketuka* to integrate traditional healing practices with modern pharmacological uses. This reaffirms the cultural and spiritual dimensions of herbal therapies in traditional medicine and presents a promising candidate for further development of complementary treatments in modern pharmacology.

Subsequent research must encompass laboratory-based studies and clinical trials to systematically validate the efficacy, dosage, and safety of *Tri Ketuka*. Collaborative efforts between contemporary health sciences and Balinese traditional practitioners may promote integrative health models while preserving and evolving Usadha knowledge within a globalized medical context.

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Appendix

Table 1. Health Benefits of *Tri Ketuka* Based on Empirical Data (Mental Illness)

No.	Indication	Formula/Composition, Dosage Form, and How to Use
Usadha Buduh		
1	Medicine for madness characterized by wandering behavior (<i>edan kabinteha</i>)	A sprig of <i>kelor munggi</i> (moringa), a sprig of mustard, nutmeg, <i>Tri Ketuka</i> (a combination of shallot, garlic, and dringo), and vinegar are made into powder
2	Medicine for madness characterized by laughing and making jokes	<i>Paria lempuyang</i> (<i>Zingiber</i> sp), coriander, <i>Tri Ketuka</i> , and vinegar are consumed <i>Kelor munggi</i> , <i>intaran/Neem</i> (<i>Azadirachta indica</i>) with the skin, <i>liligundi</i> (<i>Vitex trivolia</i>) 9 leaf buds, a mixture of yam tubers (<i>Dioscorea hirsuta</i>), vinegar, and <i>Tri Ketuka</i> are made into <i>parem</i> (topical herbal paste) and applied topically
3	Medicine for madness is characterized by saying strange things and descending behavior.	<i>Kelor munggi</i> , mustard greens, fennel, shallot, and <i>Tri Ketuka</i> are consumed and dripped into the nose and eyes

No.	Indication	Formula/Composition, Dosage Form, and How to Use
4	Medicine for madness characterized by dancing and singing	The mixture of <i>sembung bangke</i> (type of shrub that grows vines, the leaves are long and pointed), hanging stump, <i>liligundi</i> , neem with its roots, vinegar, and <i>Tri Ketuka</i> . The liquid is dripped into the ears and nose, while the pulp is used as powder and poultice
5	Medicine for madness characterized by constant singing	The mixture of <i>kejanti</i> (kind of flower tree has white flowers growing on Mount Agung), aromatic ginger/ <i>lempuyang</i> (<i>Zingiber zerumbet</i>), bangle (<i>Zingiber cassumunar</i>), ginger, pepper, <i>Tri Ketuka</i> , shallot, sinrong (a spice commonly used in <i>parem</i>), vinegar, and <i>sidem</i> (black tree ant). The liquid is dripped into the ears and nose, and the pulp are made into powder.
6	Medicine for madness characterized by reckless behavior	The mixture of any fungus that grows on rocks, the root of the banyan tree (<i>Ficus benyamina</i> Linn.), <i>Tri Ketuka</i> , 7 slices of bangle, <i>mungsi</i> (<i>Carum copticum</i>), and vinegar. The liquid is dripped into the ears, nose, and eyes. The pulp is used as poultice for the entire body.
7	Medicine for all mental illnesses	<i>Lempuyang</i> , lime juice, <i>Tri Ketuka</i> , charcoal, and salt are made into a drink to be consumed.
8	The cure for all madness	<i>Lempuyang</i> (chopped), <i>kencur</i> (<i>Kaempferia galanga</i>) (sliced and chopped), bangle (sliced and chopped), a piece of old temurose betel leaf/ leaves that have been stored or dried for a long time (chopped) are combined into one and added with five peppercorns, three pepper tips, three <i>mungsi</i> seeds, vinegar, and <i>Tri Ketuka</i> . The ingredients are mixed and made into power to be applied all over the body.
<i>Usadha Dalem</i>		
9	Medicine for madness characterized by laughing	The mixture of musk deer (secretions from the scent gland or "pod" of the male musk deer), <i>kamarunggi</i> seeds (<i>Inocarpus edulis</i> Teorst), <i>liligundi</i> leaves, neem leaves, and <i>Tri Ketuka</i>
10	Medicine for madness characterized by wandering	The mixture of mustard seeds, <i>kamarunggi</i> seeds, and <i>Tri Ketuka</i>
11	Medicine for madness with specific body marks	The mixture of mustard seeds, <i>Tri Ketuka</i> , <i>kamarunggi</i> seeds, and fennel
12	Medicine for madness characterized by joking behavior	The mixture of <i>kamarunggi</i> seeds, <i>liligundi</i> , neem leaves, and <i>Tri Ketuka</i>

Table 2. Health Benefits of *Tri Ketuka* Based on Empirical Data (*Tiwang* Syndrome)

No.	Indication	Formula/Composition, Dosage Form, and How to Use
Usadha Dalem		
1	<i>Tiwang brahmana</i> (red body condition, yellow eyes)	The mixture of shredded young coconut leaves, <i>Tri Ketuka</i> , and rice is cooked and used as a liniment.
2	<i>Tiwang bangke</i> (stiffness with bulging eyes)	<i>Kapkap</i> (banana stem) and <i>Tri Ketuka</i> are mixed and sprayed
3	<i>Tiwang gurittha</i> (tightness in hands and feet)	The mixture made of yellow meduri leaves (<i>Swietenia macrophylla</i>) and <i>Tri Ketuka</i> is applied as a scrub
4	<i>Tiwang balabur</i> (vomiting)	The mixture of yellow <i>kapkap</i> (7 sheets), fallen lime leaves (7 pieces), and <i>Tri Ketuka</i>
5	Medicine for <i>Tiwang Babahi</i> and <i>Tiwang Gombeng</i>	The mixture of roasted chilies, <i>Tri Ketuka</i> , and brown rice is grounded and applied as a scrub.
6	Medicine for <i>Tiwang Babahi</i> and <i>Tiwang Gombeng</i>	The mixture of turmeric, <i>Tri Ketuka</i> , and <i>pamor</i> powder (made from lime and betel leaves) is grounded and applied as a scrub.
7	<i>Tiwang utara</i>	The mixture of termite-eaten bed wood dust, <i>lempuyang</i> , and <i>Tri Ketuka</i> is applied to the chest
8	<i>Tiwang kenul</i> (pain in the navel)	The mixture of pepper (1 grain), <i>samanjai</i> (a shrub with a creeping stem, slightly larger nodes, palmate leaves, and legume fruit) and <i>Tri Ketuka</i> is placed on the navel.
9	<i>Tiwang mong</i> (pain that comes in the middle of the night, twisting and turning)	The mixture of <i>bila/maja</i> tree bark and fruit skin (<i>Aegle marmelos</i>), roof made from old coconut leaves (all burned), <i>Tri Ketuka</i> (mashed), and <i>indubang</i> water (red saliva) is applied as a poultice.
10	<i>Tiwang sinduraja</i> (sharp pain and stiffness, walking or spinning sensation)	The mixture of <i>jeruju</i> plant (<i>Acanthus ilicifolius</i>) and <i>Tri Ketuka</i> is applied as an ointment.
11	<i>Tiwang ghni</i> (hot body, sweating, abdominal pain, frequent drinking)	The mixture of jackfruit tree bark and <i>Tri Ketuka</i> is mixed and sprayed.
12	<i>Tiwang tikus</i> (walking around, feeling tightness)	The mixture of <i>Tri Ketuka</i> is sprayed
Usadha Rare		
13	<i>Tiwang bangke</i> (deep sleep condition).	<i>Pule</i> tree bark (<i>Alstonia scholaris</i>), <i>sintok</i> , shallot, <i>Tri Ketuka</i> , nutmeg, clove, <i>sampar wantu</i> (spices used for medicine), coriander, pomelo leaves, and red rice are mixed and prepared as a powder
14	<i>Tiwang bayu</i> (lack of energy, similar to sleepiness).	Betel leaf, shallot, and <i>Tri Ketuka</i> are mixed and prepared as a powder

Table 3. Health Benefits of *Tri Ketuka* Based on Empirical Data (Infection Disease)

No.	Indication	Formula/Composition, Dosage Form, and How to Use
Usadha Dalem		
1	Medicine for severe ear infection (deafness)	<i>Tri Ketuka</i> is mashed and dripped into the ear after being fried with coconut oil and shells
2	Medicine for boils	Hairy <i>kapok</i> (the name of the <i>kapok</i> tree/ <i>Ceiba pentandra</i> whose fruit contains <i>kapok</i> fiber plant), lime juice, and <i>Tri Ketuka</i> are made into drinking medicine
Usadha Ila		
3	<i>Ila</i> disease (leprosy disease)	The mixture of yellow mango tree bark, <i>tigaron</i> bark (<i>Crataeva nurvala</i>), <i>galangal</i> (<i>Alpinia galanga</i>), and <i>Tri Ketuka</i>

Table 4. Health Benefits of *Tri Ketuka* Based on Empirical Data (Other Applications of *Tri Ketuka* in Miscellaneous Indications)

No.	Indication	Formula/Composition, Dosage Form, and How to Use
Usadha Dalem		
1	Medicine for <i>mokan beseh mangrekurek mokan kakipi</i> (a condition related to body stiffness).	Old <i>temu tis</i> (<i>Curcuma purpurascens</i>), coriander, <i>tanjung raab</i> (a small evergreen plant type with medicinal uses), shallot, garlic, <i>dringo</i> , and <i>sari podi</i> are made into a drink to be consumed and sprayed.
2	Medicine for lack of sweating	<i>Pule</i> tree leaves, shallot, garlic, <i>dringo</i> , and thick coconut milk are roasted and mashed
3	A body scrub for all digestion ailments	Amethyst leaves (the leaves of the "Amethyst sorrel" plant, which are known for their vibrant purple color and lemony flavor), yellow chrysanthemum leaves, bangle, and <i>Tri Ketuka</i> are mashed
4	Medicine for muscle injury	<i>Lalari</i> , dried banana fronds and leaves, and dry castor leaves are burned and crushed. Then, <i>Tri Ketuka</i> are added to the mixture. The mixture is made into a powder
5	Medicine for lack of sweating	The mixture made of <i>pule</i> leaves, <i>bangle</i> and <i>Tri Ketuka</i> is rubbed on the skin after being cooked into liniment.
6	Stiff neck	Dausa root (hedge plant, has a hard stem, and reddish flowers), <i>bekul</i> root (<i>Ziziphus mauritiana</i>), <i>gangyang</i> root, and <i>Tri Ketuka</i> are mixed and applied as a scrub
7	Inability to sweat	<i>Pule</i> leaves, <i>Tri Ketuka</i> , and thick coconut milk are boiled and applied

No.	Indication	Formula/Composition, Dosage Form, and How to Use
Usadha Kuranto Bolong		
8	Medicine for tired, lethargic children	Red rice, betel fruit, and <i>Tri Ketuka</i> are grounded and applied as powder to the feet
9	Medicine for children suffering from migraines	Betel fruit, <i>tamba bisa</i> root, jumbo betle nut, <i>nagasari</i> leaves (<i>Mesua ferrea</i>), <i>sintok</i> (<i>Cinnamomum sintoc</i>), nutmeg, clove, and <i>Tri Ketuka</i> are grounded and mixed with water. The mixture is applied to the patient's head.
Usadha Manak		
10	<i>Sawan naga</i> (convulsions and restlessness with tongue protruding).	Stems, leaves and roots of <i>padang alia</i> , <i>miana</i> (<i>Coleus scutellarioides</i>), shallot, and <i>Tri Ketuka</i> are mixed and prepared as a powder
Usadha Rare		
11	Medicine for pain like being pricked all over the body.	3 eggplant leaves, galangal, aromatic ginger 3 slices each, <i>Tri Ketuka</i> , and coriander

Table 5. Mantras Used in *Tri Ketuka*-Based Therapies

No.	Indication	Mantra
1	Medicine for madness characterized by wandering behavior (<i>edan kabinteha</i>)	<i>Ong asta astu ya nama swaha, ala-ala ilili swaha, sarwa Bhuta wistaya, sarwa guna wini swaha, ah astu ya astu</i>
2	Medicine for madness characterized by laughing and making jokes	<i>Ong edan-edan a nama swaha waras</i>
3	Medicine for madness is characterized by saying strange things and descending behavior.	<i>Ong hyang astu ala-ala ili-ili sarwa brang grang wini swaha, waras</i>
4	Medicine for madness characterized by dancing and singing	<i>Ong arah-arah greha ah teka sidhi swaha</i>
5	Medicine for madness characterized by reckless behavior	<i>Ong lara muksah tutur remut, 3, anduh kita manongosin, jadma manusa maluaran kita, tan pamangan. Malih kita maring panangkan kita rauh sang bayu teka lara lunga waras.</i>

6	Medicine for all mental illnesses	<i>Ong sang baga purus wisesa, sira ngelaranin baga purusa si anu, sira apurusit, maring si anu, aku weruh ring kamulanmu nguni, matanta tangen sanghyang Raditia, matanta kiwa sanghyang Ratih, kadi pedangane sanghyang Raditia, sanghyang Ratih samangkana pepadangane, matane si anu, biar, 3, biar cali ring hening</i>
7	The cure for all madness	<i>Ong hyang ma- hyang, 3, ong manglimur ring ati, murwaras, 3, ang banyu mapupul, budeng mapupul, kelingsih mapupul, buyanati mapupul, dahah, mapupul, bayu mapupul, ong sang hyang ayu ulihakena bayu sabda idep si anu maho usuase, mu lih bayu premanane si anu maring kadam suaha, waras.</i>
8	Medicine for madness characterized by laughing	<i>Ong ena enala nama swaha puhakna (O ena-enala, destroy it)</i>
9	Medicine for madness characterized by wandering	<i>Ong asta asta hala-hala arwangan widi swaha aha astu (I ask that this ailment be healed by the grace of God)</i>
10	Medicine for madness with specific body marks	<i>Ong astu hala-hala sarwawa graha widi swaha (May all diseases and ailments be healed by divine grace)</i>
11	Medicine for madness characterized by joking behavior	<i>Ong age-age ati-ati sarwawa yuwadi bhasa swaha (O spirit, focus all energy and power on healing)</i>
12	<i>Tiwang balabur</i> (vomiting)	<i>Ong ki tiwang balabur tumber baher mantraku (O Ki Tiwang Balabur, be defeated by the power of my mantra)</i>
13	<i>Tiwang sinduraja</i> (sharp pain and stiffness, walking or spinning sensation)	<i>Ong atma jiliah tka keret jong 3x (O soul, come and bind tightly 3x)</i>

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